5/84

L.I.S.T. Group

LONG ISLAND
SINCLAIR TIMEX
GROUP

Centerport, N.Y. 11721

L.I.S.T.ing

I. MEETING NOTES - APRIL 29, 1984

Our last meeting was very productive session.

a) Heniz H. contributed Timex's 2068 application notes and brought his Brother EP-44 Type-writer printer. These cost between $250 and 300 and we have successfully interfaced it with the Byte Back MD-2 Modem's RS 232 port. Not a bad deal for an almost letter quality printer.

b) Nazir P. demonstrated the Zeus Assembler for 2068. Not bad, but possibly lacking some of the features advertized for the Spectrum. Lost in "translation" perhaps. Nazir also demoed two excellent BASIC arcade games for the 2068, which have become the first members of our "Library".

c) Bob M. has taken Nazir's "Music Maestro" program and has promised to show us some fancy embellishments, next meeting.

d) Jeff Street attended his first meeting Sunday. Jeff demoed a BASIC and ML program which provides various sizes of "Big Characters" on the 2068. No mean feat, considering the complexity of the display file.

e) Paul D. demoed Thomas B. Woods's Pro/File 2068 and the Game Changer interface. PRO/File is an outstanding data handling facility. We entered several members names, etc. and tested the lightning swift sort routines, editing features, etc. The Game Changer, reviewed in issue 2/84, was used to download ATARI games into a ZX and save them on disc for later playback.

II. Next meeting is scheduled for June 3rd at 3:00PM. Place will be either Day Drive or nearby; we're starting to outgrow the "den of inquiry". Do remember to bring a blank cassette if you want a copy of the games or music programs developed by the other members. Also, please feel encouraged to bring some of your own software for demo. Hardware, books you've found helpful, and even catalogs are always in demand too. We'll have 81's, 1000's and 2068's set up beforehand. We either have, or will be writing to some of the British Software houses and clubs for help with Spectrum software.

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P.J. Donnelly

SOFTWARE REVIEW

ITEM:	VOXCOMP
FROM:	SYBER 1325 Diller Road Ocean Springs, Ms. 39564
FUNCTION:	Vocabulary Manager for "Parrot" voice synthesizer
COST:	< $ [illegible]
SIZE:	8K/16K on Tape
LISTING/LISTABLE:	No/Yes

Voxcomp is one of the first commercially available software packages produced for use with R.I.S.T.'s "Parrot" voice synthesizer. It is written in BASIC and serves as a development tool for users who want to add speech to their programs. Voxcomp comes with a 140 word vocabulary and has provision for creating user defined words and phoneme strings. The words and string, once developed in Voxcomp, can then be interfaced into user programs.

Perhaps the best way to describe Voxcomp is to take you through a "typical" session. Let us suppose that you are about to develop a BASIC game program and would like to have your Parrot "sound-off" if certain events occur during game play. We'll further assume that your program will run from lines 300 on in BASIC.

After LOADing VOXCOMP, you'll be greeted by a main menu board which gives you the choice of looking at, saying or editing the phrases VOXCOMP already has in memory. These include numbers (any number under one billion can be pronounced) and almost 100 common words (e.g., AND, DOWN, WARNING, YES, NEXT) as well as some sample phrases. To check to see if these are pronounced the way you like them, you can list the words and have them pronounced by selecting one-key menu entries. If you're not satisfied with either the text name of a word or its sound you can enter an "edit" sub-menu and change what you wish. New entries can also be made in the built-in vocabulary beginning with the 141st phrase (of 240).

Each "word" can contain ten allophone codes and can be assigned a 10 character English "title" which you can use to keep track of the word's meaning. If we want our ZX/TS to say "I'm sorry", we'd find that "SORRY" is available, but "I'M" is not. To create "I'm" we enter the "new" entry mode and key in the allophone codes AY and M. In the edit mode we then use another one-key code to pronounce and syntax check our entry. We should note that editing, if required, is done by cursor control.

Since we want to use the phrase "I'm sorry" in our game, we'll need to put it in a string which can be transferred to the game program, along with RIST's driver routine. First though, we can concatenate the two words we have. "I'm" was our first new entry, so its now word #141. "Sorry" is built-in and is word #108. Through the use of the new entry mode we can enter a new code 142 and append 108 onto 141. Our next step is to put this phrase, and any others we have made, into a string function. Again, this is done automatically by invoking the "Reduce" mode. Here, most of Voxcomp is deleted and only a skeleton driver program, which we enter from BASIC, and the allophone codes (stored as a string variable) are left behind for our game program to use. We can now enter our game program and use simple subroutines to call up any of the phrases we've stored as strings.

If all that sounds difficult, it is, at first. The 19 pages of documentation and 6 pages of appendix must be kept close at hand during your early programming sessions, as the Voxcomp is fairly complicated to use. This is primarily because of the high number of involved features it offers. If you've tried developing phrases on the original "exclusive" program, or even my "super" exclusive program, you'll soon appreciate the extra organization (and large built-in vocabulary) supplied with this package.

There were only a few typos in the Voxcomp manual, and the removable reference sheets in the back make the operating task easier. On the negative side, Voxcomp uses "abbreviated" versions of the RIST codes, supposely to make your entry faster. This seems to make sense at first e.g., using "S" instead of "SS", but in fact takes almost as long, as each allophone must still take up 3 spaces in your word entry. That is, "S" must be entered as 'Sɓɓ' (where ɓ is in blank) instead of 'SSɓ' as in the original RIST coding. That still looks like the same number of keystrokes to me. I will admit that the fault is probably more RIST's than Voxcomps, as this new coding seems better to me.

Other complaints: the cursor editing is very slow, and of course, the "Parrot" can only be used in FAST MODE so you loose your screen when the unit speaks. Finally, when you enter a sub-menu (e.g., edit) the higher level commands no longer work. This is probably not a big problem, but some confusion exists over command nomenclature (R is used for both "Return" and "Reduce").

I've used Voxcomp to add sound to a short little game program and found it does a creditable job of creating and storing my coded phrases. The phrases are called by simply assigning the number of the sub-phrase of your User String to a variable in your program and calling a short string slicing subroutine, supplied by Voxcomp. I found the documentation a little shorter than I would have liked and learning to use Voxcomp somewhat tedious. Syber's BASIC coding is also exceptionally hard to follow and is not documented.

Voxcomp is the "only game in town" though [illegible] after a few hours spent hacking away at word generation you should feel comfortable with it. I'd rate the Voxcomp 7 (fair to good) [illegible] scale of 10. If you're serious about developing "talking" programs or just want a good pre-prepared vocabulary, Voxcomp will add valuable software power to your Parrot.

MORE MOIRE THAN YOU BARGAINED FOR?

That shimmering wavy pattern on your TV screen is from RFI (Radio Frequency Interference) and is called a Moire pattern. It is caused by radio waves leaking from your ZX/TS getting into your TV's tuner circuits, either through the power line or the air.

Two simple ways to reduce the effect of RFI are to:

1) Plug your computer or TV into another outlet (on a different circuit). You can test which circuit is which by having someone observe lamps plugged into the various outlets while you trip the circuit breakers one at a time.

2) Separate the computer from the TV as far as possible. Use a longer coaxial (shielded) cable, about 15 feet is a good length of cable. The cable should be RG-59 or equivalent with shielded RCA plugs on both ends.

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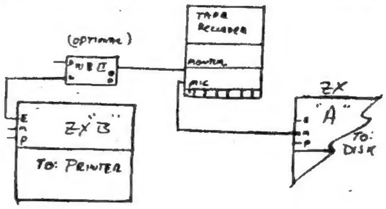
MACHINE TO MACHINE TRANSFERS

With the current low prices being what they are, and the plethora of incompatible peripherals out there, I suspect that may others may be in my predicament.

Picture this;

You have two ZX/TS machines, one hooked up to a disk drive, the other to a non-Timex printer. You can't connect both peripherals at the same time because their addressing schemes conflict. You develop your software on the disk drive for speed in making backups and for crash recovery, but would like to transfer the data to the ZX with the printer. Normal procedure here would be to "SAVE" the program to tape from the disk machine and then LOAD the program back to the printer machine for output, a process that can require as much as 15 minutes for a 16K program.

That time could be cut in half if you could directly download from machine A (the disk equipped system) to machine B (the printer). This isn't easy, as the output from machine A is only at about 5 millivolts while the input machine B is looking for needs to be about 5 volts P-P. It can be done though, and a backup copy made at the same time, if you have the right type of recorder (I used a Panasonic RQ 2107A, but most portable machines should work.) The secret is to use the "monitor" function built into most machines. Hookup is as shown below:



The monitor jack will provide a boosted signal which should drive second machine. Procedure is:

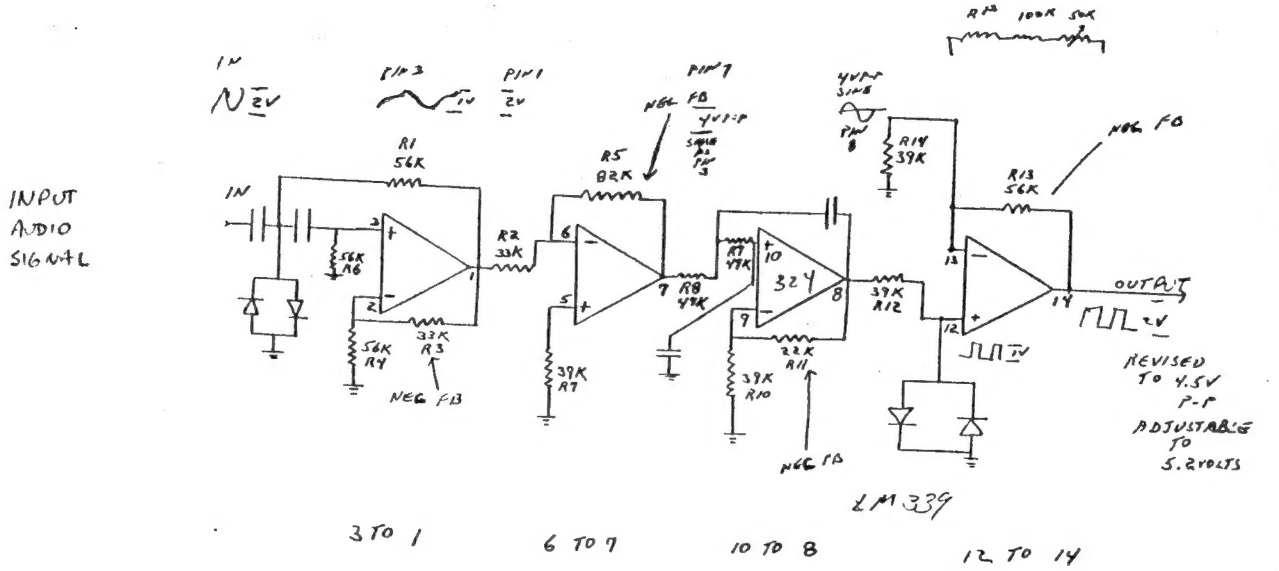
1. With all three machines powered up and connected as shown, enter LOAD "" in machine B.
2. START the Tape recorder with record and play pressed and a tape installed.
3. Enter SAVE "PRGMNAME" in machine A.
4. You should see the normal load and save patterns if you alternately plug in the RF cable from each machine into the TV-Game switch's RCA jack input. Two TV's, if available, make the whole procedure easier.
5. When machine A is done, you're all set. Print out the data from machine B and you've even got a backup copy on tape.

Note that the Winky Board II may be optional depending on your machine's output and that it should be hooked up in the standard "LOAD" mode.

Also note that the "monitor" jack on most portable players produces a fixed output which may or may not be suitable for loading.

Finally, if you don't want to use a tape (even on old "dummy" one), you'll need to stick the eraser end of a pencil into your tape player and hold back the write protect latch. This is a little finger in the left rear of the cassette compartment, which is held back by the breakaway tabs located on the back ends of standard blank cassettes. Holding it back simulates the presence of a recordable cassette (i.e. with tabs intact).

"SMOOTHER" By H. Hanken
(Prototype)



SIGNAL AT 100MV IN
STILL PROVIDES 2V LINE OUT
STARTS LIMITING AT 200MV (3.5V P-P)

250MV

SINE WAVE RISE TIME • 110USEC
SQUAREWAVE " " 20USEC

NOTE OPERATES AT SUPPLY VOLTS DOWN TO +4 VOLTS.

RISETIME IMPROVE APPROX 5 TIMES

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COMPUSERVE    DEMO       PAGE CIS-21

********************************

 COMPUSERVE INFORMATION SERVICE

       COMMAND SUMMARY
********************************

  MOST CIS COMMANDS CAN BE
ABBREVIATED TO UNIQUENESS.   ONE

LETTER IS SUFFICIENT IN MOST
CASES.  TERMINATE ALL COMMANDS
WITH A CARRIAGE RETURN (MARKED
<ENTER> ON SOME TERMINALS).


KEY S OR <ENTER> TO CONTINUE
```

```
COMPUSERVE    DEMO    PAGE CIS-162
 BRIEF COMMAND SUMMARY
********************************


 T - TOP MENU PAGE
 M - PREVIOUS MENU
 H - HELP
 OFF OR BYE



KEY S OR <ENTER> TO CONTINUE
M
```

```
COMPUSERVE    DEMO       PAGE CIS-4


USER INFORMATION


1 WHO IS COMPUSERVE?
2 WHAT IS VIDEOTEX?
3 COMMAND SUMMARY  USAGE TIPS
4 REGULAR SUBSCRIPTION
  INFORMATION

LAST MENU PAGE.  KEY DIGIT
OR M FOR PREVIOUS MENU.
M
```

```
COMPUSERVE    DEMO       PAGE CIS-1


COMPUSERVE INFORMATION SERVICE

1 HOME SERVICES
2 BUSINESS  FINANCIAL
3 PERSONAL COMPUTING
4 SERVICES FOR PROFESSIONALS


5 USER INFORMATION
6 INDEX

ENTER YOUR SELECTION NUMBER,
OR H FOR MORE INFORMATION.
3
```

```
COMPUSERVE    DEMO       PAGE PCS-1


PERSONAL COMPUTING SERVICES

1 NEWS
2 COMMUNICATIONS
3 SHOP AT HOME
4 GROUPS AND CLUBS

LAST MENU PAGE.  KEY DIGIT
OR M FOR PREVIOUS MENU.
4
```

```
COMPUSERVE    DEMO       PAGE PCS-6


  GROUPS AND CLUBS CAN "GO
NATIONAL" ON THE COMPUSERVE
INFORMATION SERVICE.   MEMBERS
THOUSANDS OF MILES AWAY OR JUST
AROUND THE CORNER CAN GATHER FOR

A MEETING THROUGH THE ON-LINE
COMMUNICATIONS CAPABILITIES.
THE PAGES THAT FOLLOW GIVE
DESCRIPTIONS FOR MOST OF THE
CLUBS THAT "MEET" IN PERSONAL
```

BYTE BACK MD-2 MODEM KIT

What you see on the left is a series of "screens" which I dumped to my printer while signed on to Compuserve's demo area. Two hours of connect time, to that area only, are provided with Byte Back Md-2 Modem. The MD-2 has been reviewed in Syntax and other magazines and is an excellent piece of hardware. Little has been said about the kit version, however.

The MD-2 kit costs $119.00 while the assembled and tested version is $149.00. Unless you are a very experienced kit builder, I must advise you to steer clear of the kit. The parts and directions are all there but, I suspect you'll find them exquisitely difficult to follow. The documentation consists of 3 1/2 dot-matrix printed pages, a parts list, a few sketches and, thank goodness, a schematic. Step by step directions are not given, except for the very crucial stages.

I found several directions either wrong or missing (step H says R32 and means R31, the sketch below step 6 is missing, and figure 4 is a mystery to me). The parts packages were not marked to show their contents. Finally, several critical connections must be made on the back side of the board, one to an IC pin directly (no trace or hole available), others with wires tacked-on to pairs of series resistors whose common leads are "flapping in the breeze".

If all I've said so far has made you decide to turn thumbs down to the MD-2, please reserve judgement and read on. Despite the poor documentation and somewhat hurried use of jumpers and trace cuts, once the unit is assembled it works very well.

My MD-2 worked the first time I properly configured it in 16K (for some reason my 2K program would not LOAD). We've also interfaced it with an EP-44 typewriter, hooked up as a printer, with excellent results. Byte Back used some excellent IC's (the 1488,89's are hard to destroy) and has produced a reliable hardware, software package. I give the assembled MODEM a 9, and the kit a 7 on my 1-to-10 scale. Both would have ranked higher if more documentation and software (including source listings and/or entry points) had been supplied.

Byte Back is at RT 3, Box 147 Brodie Road, Leesville, S.C. 29070
(803)-532-5812

CATALOGS RECEIVED

Quicksilva	-	Games from $19.95 for 2068
Thomas Woods	-	Data Handling for 1000
E.H. Enterprises	-	Battery Backup (UPS) start a $100 for 1000 & 2068
Printer Paper	-	About - $2.00/roll in Large Quantities
Speedware	-	Gofer - Data BASE - T/S 1000 $35.00

Annual Dues.................$12.00

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Your reviews, programs, comments, hardware projects, etc., are eagerly solicited for publication in LISTing.

Best Buy - 47th Photo
TS1000-16K 4-7 TAPES - $43.95

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HARDWARE REVIEW

ITEM: REPORT GENERATOR BOARD
FROM: ENER-Z COMPANY
PO BOX 635
FORT WASHINGTON, PA 19034
FEATURES: RTC, A/D, I/O PORTS, PRINTER INTERFACE
PRICE: $89.95 + PH - Kit assembly

Everything Interface

P.J. Donnelly

If you could buy only one peripheral which would let your ZX/TS communicate with the real world, Ener-Z's Report Generator just might be it. The board's features include a real time clock, analog to digital interface, Input/Output ports and a Centronics printer interface. All those features, and the under $80 price tag, sounded like too good a buy to pass up to me, especially since one or two to these features alone would cost more than this board from most other vendors. Does the R.G. deliver? Let's take a look.

Physically, the R.G. board is 4" X 6" and has a cleanly designed physical layout for its 16 IC's and assorted passive components. Construction is professional, with few jumpers, plated through holes, and sockets for the more critical IC's. An on-board regulator is supplied. This helps to keep your ZX/TS's internal regulator cool. A battery holder is provided for the real time clock (RTC) and most of the offboard tie-ins can be made using standard DIP (dual-in-line pin) headers. These last are easy to obtain and inexpensive. In most uses, extra ground or 0 volts lines are provided. These fall between the active lines and should help keep down the effect of transients in your ribbon cables to the real world. The board plugs onto the ZX/TS expansion port and a through-edge connector is provided for other add-ons (e.g., RAMPACKS).

The heart of the R.G. board is a Z80 PIO (peripheral input/output) chip. Through the very clever use of an internal data bus (on the R.G. board), Ener-Z has expanded the capabilities of this simple chip to allow it to address what, in effect, are more than five (5) separate port configurations instead of the conventional two (2). Two versions of R.G. are available, one has all its software on a 2716 EPROM (mine is this type), the other has the driver software in RAM. The RAM version is required if you already are making use of the 2800H to 2B00H area where the EPROM version would normally reside. All functions on the R.G. board are made by USR calls to the appropriate subroutines on the EPROM, which, in turn executes the I/O functions.

An OKI MSM 58321 clock chip provides the year, month, day, week, hour, minutes and seconds for the RTC. With 3 Nicad batteries installed and the clock setting software (supplied as a listing) entered, you need only enter the correct time once and your ZX/TS will always know exactly what time it is. This is especially helpful if you want your ZX/TS to perform certain I/O functions at specified times.

Eight bit input and output ports are provided by a 74LS 244 buffer and 74LS 373 latch respectively. The inputs can monitor digital signals in the TTL range (0 or 5 volts). Real world signals can either be directly coupled to the buffer lines (e.g., simple switches) or coupled through conditioning circuits (e.g., relays). Outputs are also TTL compatible, through load carrying capacity is only moderate. To drive a large fanout or heavy load, you'd need a power amplifying/buffering stage (e.g., triac to run 110 volt circuits).

The analog converter section of the board uses a National ADC0809, eight bit, eight channel port to convert real world signals in the range of 0-5 volts into their digital equivalents. As an example, a measurement of about 50 means the ADC input is seeing about 1 volt d.c. With eight channels, you can monitor the status of 8 separate analogue devices. Typical uses here include monitoring rotary type joysticks (paddles), thermistors, photovoltaic cells, peak detector circuits and pressure transducers.

Up to this point we've seen how this board can tell what is happening off-board (input and A/D), know when it's happening (RTC) and even perhaps do something about what it sees (output). Now we're at the stage where, perhaps, you can see how the board got its name. The unit can also generate reports about what's going on, this time by using its final feature, a Centronics parrallel printer interface. For this important, high speed task the PIO ports are used directly. Eight data lines transmit ASC II character codes generated by a lookup table in the EPROM. The EPROM effectively "overlays" the Sinclair ROM for this operation, allowing the support of Sinclair's LPRINT, LCOPY AND LLIST commands directly, for the printing of the standard character set. Graphics are not directly supported, but special USR calls can produce a byte code which will produce other characters depending on your printer's capabilities. The overlay of Sinclair's ROM appears to be done with a tricky application of the $\overline{\text{ROMCS}}$ signal when the printer commands are invoked.

The other two lines provided by the printer interface are $\overline{STB}$ and $\overline{ACK}$ (strobe and acknowledge). I used the interface with a Centronics 101 printer and Ener-Z says it works with EPSON and should work with most other Centronic style printers. I agree, but suggest you include your printer type in any correspondence you have with Ener-Z.

After getting my R.G. board, I put it through its paces, on and off, for over a month. The RTC lost only a few seconds, and I hooked up switches (Joystick actually) to the input ports. I've used the output ports, all eight lines, with two off-board chips to drive a 3 digit 7 segment display. This last lets me see measurement status without turning on my TV. The A/D converter measured some resistance circuits I'd set up quite accurately and I've even tied it into a thermistor and gotten a fairly good thermometer, accurate without amplification to about 2-3°F. To get the printer interface working, you'll need to make up your own cable. You can get everything you'll need at Radio Shack or a number of the mail order houses. Try to keep your cable under 8-10 feet in length.

If the R.G. board sounds pretty good up to this point, make no mistake, it is. However, it seems that nothing is ever absolutely perfect and there are some negative aspects to the board. Minor turn offs which don't really affect the boards performance included a loose battery connector on my board, some "afterthought" pull up resisters tacked on to assure TTL-CMOS compatiablity and the lack of a case. Three more meaningful items, which might even affect your decision to get an R.G. board, do need mentioning. First, is the somewhat hastily prepared documentation. While there is an excellently documented source listing for the EPROM, the supporting narrative on BASIC applications has quite a number of typos and no page numbers. The 29 page documentation swings back and forth between the EPROM and RAM based USR calls, and while a mini hex monitor for loading the RAM version (you must enter this by hand) is provided, the code listing is not. I'd suggest that Ener-Z either prepare two separate versions of the documentation or one complete and comprehensive dual purpose version. I think the average user will be able to use the board, but straight BASIC programmers (i.e., who don't use ML and have little hardware knowledge), may find they'll have to make a call or two to Ener-Z for guidance. I found them most helpful on the phone, myself.

The next complaint is one I have voiced before. This is that we're not told explicitly in either advertising or documentation, which port locations are used. In the case of the R.G. board, with a little digging, the source listing documentation does indicate addresses 01,03,05 and 07. However, a quick look at the board's **partial** decoding will show you that <u>any</u> odd numbered port below 80H will respond to the I/O calls from EPROM. Keep this in mind if you have other I/O mapped peripherals.

The other significant "flaw" with the R.G. board has to do more with the "nature of the (TIMEX) beast" than with the board itself. As you probably know, the ZX/TS cannot directly address I/O ports. In order to do so then, we must jump to an ML (machine lanuage) I/O routine and this means using FAST mode and consequently lots of blank screen time and "flicker". I probably wouldn't have thought this to be a significant problem if I hadn't seen JK Audio's 310 board. While this board costs about as much as the R.G. and has fewer features as a stand alone board (I/O ports and clock only), it uses memory mapping to accomplish its I/O functions. This means that the JK board can be run completely from BASIC and provide a continuous rock-steady display while performing its I/O function. I don't feel the R.G. board should be downrated on function because of the difference, only that users should be aware of a need for a little more effort required to produce good looking screens with the R.G. board.

To more than make up for these little flaws, the R.G. offers its high reliability, numerous features, low cost and some bonus features not mentioned in its documentation. The board nominally has one 8 bit input and one 8 bit output port. You could concieveably stretch these, with some off-board multiplexing,to 64 each. How? Schmitt conditioning of signals fed to the A/D converter could give you 8 more digital input lines. Also, the printer port has 8 bits, this time with handshaking. There are other such combinations which you could implement with a few IC's to suit your particular application. A final extra bonus is that about 180 bytes of the EPROM are not yet programmed. Using sufficient care, and an EPROM programmer, you could use this area to add your own special USR routine to the board.

On balance, I found the R.G. board an excellent value and perhaps (next to my $39.95 TIMEX). the most cost effective computer purchase I've made. If you need any [illegible] of the board's features, I recommend buying it. I've given this board a hard [illegible] yet 9.9 on my price-for-value scale. A "10" could be obtained if the unit were also offered as a kit, the RAM driven version was provided on tape, and documentation was cleaned up a little. Ener-Z has done an outstanding job with its first entry into the ZX/TS peripheral market. As a suggetion for further items, some detailed I/O applications (perhaps collected from users) could be provided and even hardware (e.g., temp probes, light pens, synthesizers) described or made available.

[illegible] Donnelly